

		L1		L2		L3		L4	
		mean	st.dev.	mean	st.dev.	mean	st.dev.	mean	st.dev.
J	P1	62.8	15.7	20.1	4.7	9.1	3.1	30.3	8.7
	P2	89.6	34.8	31.4	12.3	17.0	6.5	37.7	9.8
	P3	39.3	16.6	24.0	9.5	12.2	6.6	22.2	10.3
S	P1	65.1	28.4	18.0	3.0	12.4	5.6	35.3	16.8
	P2	87.1	49.1	30.7	12.2	21.8	8.2	42.9	21.7
	P3	41.4	22.8	26.4	11.6	16.1	10.5	23.8	12.6
E	P1	70.4	35.8	17.7	5.3	11.5	7.0	32.4	6.8
	P2	116.2	67.3	32.6	10.6	22.5	11.5	39.0	9.0
	P3	48.6	21.2	22.2	5.8	16.3	12.6	23.0	7.7

Conclusion: Guidelines for regional LN did not significantly improve the consistency of contouring among ROs. The J-ROs were the most accurate in contouring according to AIRO guidelines and showed the highest level of homogeneity, while the S-ROs followed the guidelines to a lesser extent, probably because of higher self-confidence.

OC-0052

Long-term age dependent failure pattern after BCT vs. mastectomy in low-risk breast cancer patients

T. Laurberg¹, C. Lyngholm¹, J. Alsner¹, P. Chritiansen², J. Overgaard¹

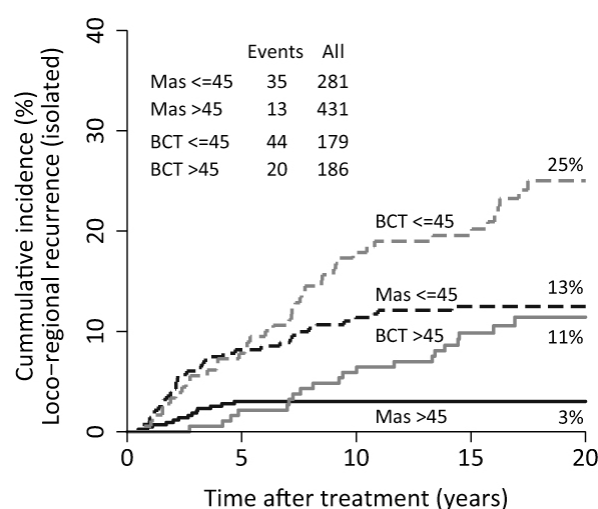
¹Aarhus University Hospital, Department of Experimental Clinical Oncology, Aarhus, Denmark

²Aarhus University Hospital, Department of Surgery P- Breast and Endocrine Section, Aarhus, Denmark

Purpose or Objective: Optimal local treatment for young women with early-stage breast cancer remains controversial because of the lack of knowledge as to whether local recurrence (LR) can be the site of metastatic disease. The aim was to describe the age depending LR pattern as a function of time (0-20 years) and local treatment, given as either Breast conserving therapy (BCT) or mastectomy alone. Furthermore to test, if LR was associated with an excess risk of distant metastasis (DM) and translate into a higher mortality after BCT.

Material and Methods: 1077 Danish patients were enrolled in this population-based cohort study. The patients were diagnosed in the period from 1989 to 1998, classified as low-risk (lymph-node negative, tumor size <5 cm), treated with mastectomy (N= 712) or BCT (N=364) and received no systemic treatment. The cohort included all Danish low-risk patients below 41 years (N = 305) and patients from one part of Denmark. Patient identification, treatment, and 20-year recurrence data were ascertained from the DBCG.

Results: After 20 years the cum incidence of LR was 18 % after BCT (N=66) and 6.7% after mastectomy (N=55). The LR pattern of failure was different depending on age: young (<45 year) vs. old (>45 year) and treatment: BCT vs. mastectomy. The older mastectomy patients developed only very early LR (< 5 year), young mastectomy patients developed early LR (0-10 year), and BCT patients despite age developed LR throughout the 20-year period (Fig 1). Among young patients, the BCT group had a higher risk of LR after 20 years compared to the mastectomy, RD = 13% (4.8-20), and LR was a prognostic marker for DM, HR =2.0 (1.3-3.1). The 20-year mortality among the young patients was significantly higher after BCT compared to mastectomy: Breast cancer death, HR =1.6 (1.0-2.5) and Death, HR =1.7 (1.1-2.6). Among the older patients, LR was not a prognostic marker for DM after 20 years, HR: 0.9 (0.3-2.2), and local treatment was not associated with Breast cancer death, HR =0.8 (0.5-1.2).



At risk

Mas <=45	281	219	191	146	57
Mas >45	431	339	271	187	43
BCT <=45	179	140	110	84	32
BCT >45	186	157	128	89	23

Conclusion: In the group of patients treated with mastectomy all LR occurred within the first 10 years. In contrast, BCT patients developed LR throughout the period and had a significantly higher cumulative incidence of LR at 20 years. Within the young patients LR was associated with DM, and BCT was associated with a significantly higher mortality. Among older patients LR was not a prognostic marker for DM and there was no difference in Breast cancer mortality between the two treatment groups.

OC-0053

Re- irradiation for locally recurrent breast cancer

E. Bräutigam¹, C. Track¹, M. Geier¹, H. Geinitz¹

¹Krankenhaus der Barmherzigen Schwestern - Linz, Radiation Oncology, Linz, Austria

Purpose or Objective: To report an analysis of treatment outcomes and toxicity of a cohort of patients re- irradiated after a second breast conserving surgery or no further surgery.

Material and Methods: Between 11/05 and 10/15, 32 women were re- irradiated with 50- 60 Gy for locally recurrent breast cancer. The first RT course included postoperative radiotherapy with a total dose of 50 Gy in 25 or 50,4Gy in 28 fractions followed by a boost dose to the tumor bed according to risk factors in 81.3%. In 18.7% supraclavicular nodes were treated with 50Gy. The median age at first diagnosis was 53.3 years (range 36- 69.7). 78.1% of the women were postmenopausal. 81.25% of the tumors were pathologically classified as T1, 12.5% as T2 and 6.25% as

ductal carcinomas in situ. Axillary lymph node involvement was seen in 34.3%. Most of the tumors were estrogen positive (68.75%) and progesterone positive (65.6%). A systemic therapy was given in 81.25% of the patients. After second breast conserving therapy or no surgery re- RT was given to the involved quadrant using external- beam ports (electrons or photons) with doses of 50-60Gy in 2Gy per fraction. The median age at local relapse was 65.8 years. A second breast conserving therapy was performed in 90.7% of the women, 9.3% had no surgery and were re-irradiated to a dose of 60Gy. A systemic therapy was given in 84.3%. Survival and local control were calculated by the Kaplan-Meier actuarial method.

Results: A total of 32 patients were retrospectively analyzed. The median follow up of survivors was 181 months from first diagnosis and 33 month from second RT. At the time of analysis 4 patients had died. The median time between first and second RT was 9.9 years (range 1.8- 20.3). Fifteen years after first diagnosis 86% of the patients were still alive. Four women died, 3 on cancer. After second RT only one acute G2 toxicity of the skin was reported (desquamation). Late toxicity was scored using the LENT- SOMA Score Criteria. Lymphedema (G1) of the ipsilateral arm was observed in 3.1%, 3.1% reported on intermittent pain in the breast and 9.3% presented with an asymptomatic breast edema. The highest rate of late toxicity was G2 fibrosis in 18.7%. No G3 or G4 toxicity was observed.

Conclusion: Carefully planned re-RT of the involved breast quadrant is a safe alternative therapy for those women who did not give their consent to the recommended mastectomy. No second local relapse was detected after re-RT. Acute side effects were low. In 18.7% of the women fibrosis G2 was detected.

OC-0054

Reirradiation+hyperthermia for recurrent breast cancer-en-cuirasse in previously irradiated area

S. Oldenburg¹, J. Crezee¹, Y. Kusumanto¹, R.M. Van Os¹, S.B. Oei², J.L.M. Venselaar², P.J. Zum Vörde Sive Vörding¹, C.R.N. Rasch¹, G. Van Tienhoven¹

¹Academic Medical Center, Radiation Oncology, Amsterdam, The Netherlands

²Institute Verbeeten, Radiation Oncology, Tilburg, The Netherlands

Purpose or Objective: Cancer en cuirasse is a severe locoregional manifestation of breast cancer, usually occurring after a number of treatment failures. Treatment options are limited. One hundred and sixty-nine patients were treated with re-irradiation and hyperthermia (reRT+HT) from 1982 till 2006. Response and toxicity rates as well as the locoregional progression free interval were determined to assess the palliative value of this treatment.

Material and Methods: All patients had received extensive previous treatments, including surgery, irradiation (median dose 50Gy with or without boost) and systemic treatments. Seventy-five percent of patients had 1-7 previous locoregional recurrence episodes; 68% were treated with systemic therapies and 27% underwent salvage surgery.

At start of re-RT+HT the tumor area comprised > 3/4 ipsilateral chest wall in 54% of patients. Fifty-two percent had areas of ulcerating tumor. Distant metastases were present in 45% of patients. reRT consisted typically of 8x4Gy, twice a week or 12x3Gy, four times a week. Superficial hyperthermia was applied once or twice a week using 434MHz Contact Flexible Microstrip Applicators (CMFA), heating the tumor area to 41-43°C for one hour.

Results: The treatment was well tolerated; 154 patients completed treatment, only 15 patients did not, due to disease progression in 12, toxicity in 2 and refusal in 1 patient. Overall clinical response rate was 72% (30% CR; 42% PR), while only 6% showed PD. Median follow-up time was 7 months. The 1-year progression-free-interval was 24% with a 1-year survival rate of 36%. Acute ≥ grade 3 toxicity occurred

in 33% of patients and consisted mostly of ulceration and dermatitis. The occurrence of radiation ulcers was significantly related to the presence of ulcerating tumor before the start of the reRT-HT (P=0.004, HR = 4.4).

Conclusion: The combination of re-irradiation and hyperthermia is well tolerated and results in high response rates despite extensive disease and resistance to previous treatments. ReRT+HT is a worthwhile palliative treatment option for this patient group who suffer from extensive locoregional tumor growth and have a very poor prognosis.

Proffered Papers: Clinical 2: Adverse effects in radiotherapy

OC-0055

Pseudo-progression after stereotactic radiotherapy of brain metastases is serious radiation toxicity

R. Wiggeraad¹, M. Mast¹, J.H. Franssen², A. Verbeek- de Kanter¹, H. Struikmans¹

¹Radiotherapy Centre West, Radiotherapy, The Hague, The Netherlands

²Haga Hospital, Radiotherapy, The Hague, The Netherlands

Purpose or Objective: Stereotactic radiotherapy (SRT) of brain metastases results in regression of most treated metastases, but subsequent lesion growth may occur and is caused by either tumor progression or pseudo-progression, which is probably a radiation effect on surrounding normal brain tissue. It is unknown if active treatment is indicated in symptomatic patients, or if it is better to wait for spontaneous recovery. The purpose of this study is to describe the clinical course of brain metastasis patients developing pseudo-progression after SRT to improve clinical decision-making.

Material and Methods: Follow-up MRI scans of all patients who received SRT of brain metastases from 2009 through 2012 were reviewed for post SRT lesion growth. Depending on the volume of the metastasis, the patients had received one fraction of 21Gy, 18Gy, or 15Gy, or three fractions of 8Gy or 8.5Gy. The GTV-PTV margin was 2mm. Pseudo-progression was considered to be the cause of this lesion growth if a histological diagnosis of necrosis had become available, if the lesion had shown subsequent regression or if two neuro-radiologists agreed upon this diagnosis based on a review of the follow-up perfusion MRI scans. The clinical course of the patients with these pseudo-progressive lesions was retrospectively studied.

Results: In a total of 237 treated patients we identified 37 patients with 50 pseudo-progressive lesions. The median follow-up of all patients still alive was 40.7 months. The main clinical symptoms that were attributed to this lesion growth were neurologic deficits, headache and seizures in 19 (51%), 3 (8%) and 4 (11%) patients respectively (unknown in one). Ten patients (27%) had no symptoms attributed to the lesion growth and remained asymptomatic afterwards. Of the 19 patients with neurologic deficits one improved after spontaneous regression of the lesion, one improved after surgery and 17 did not improve. Two out of the four patients with seizures improved with ant-epileptic drugs (AED's), one improved after surgery and one did not improve. Only one of the three patients with headache improved with steroids. Spontaneous regression of an initially pseudo-progressive lesion was observed in 18 patients. Twelve of these 18 patients had symptomatic pseudo-progression, but only one of these 12 patients experienced neurologic improvement without treatment. In 6 patients their deaths were related to the pseudo-progressive lesion.

Conclusion: Patients with an asymptomatic pseudo-progressive lesion frequently remain asymptomatic. Patients with a symptomatic pseudo-progressive lesion only rarely recover spontaneously. Active treatment, such as surgery, should be considered for these patients. Therefore,